

Notice of Allowability

Application No.

09/540,729

Examiner

Dmitry Levitan

Applicant(s)

GURA ET AL.

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendmnet, filed 09/15/04.
2. ☒ The allowed claim(s) is/are 1-6,8-16, 18-23 and 26-30 renumbered as 1-4, 6, 5,7-13,15-26 and 14.
3. ☒ The drawings filed on 31 March 2000 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

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Amendment, filed 09/15/04, has been entered. Claims 1-6,8-16, 18-23 and 26-30 are allowed.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mark Zagorin on 12/06/04.

Claims 13, 15, 23 and 27 have been amended per Attachment A.

Note. Claims 13, 15, 23 and 27 were amended, because they were reading on Collier, Path allocation in a three-stage broadband switch with intermediate channel grouping, INFOCOM '93 proceedings, IEEE, 28 March-1 April 1993, pages 927-934.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dmitry Levitan whose telephone number is (571) 272-3093. The examiner can normally be reached on 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dmitry Levitan
Patent Examiner.
12/07/04



HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Attachment A.

AMENDMENTS TO THE CLAIMS

Please amend the claims as indicated in the following listing of all claims:

1. (Previously presented) A method of sharing multiple resources among multiple requesters using an arbiter, comprising:
receiving requests for the multiple resources from the multiple requesters;
determining respective request priorities corresponding to respective requests for respective resources made by respective requesters, each request priority being determined according to at least a resource priority, resource priority being inversely related to a number of requests made for a particular resource; and
allocating at least some of the resources according to request priorities.
2. (Original) The method as recited in claim 1, wherein at least one of the requesters is requesting multiple ones of the resources.
3. (Original) The method as recited in claim 1, wherein at least one resource is requested by multiple requesters.
4. (Original) The method as recited in claim 1 further comprising allocating at least one of the resources to one of the requesters according to a round robin scheme.
5. (Original) The method as recited in claim 1 wherein the arbiter using the round robin scheme during an arbitration cycle in which all requests for all resources are considered, attempts to allocate at least one resource according to the round robin scheme prior to allocating resources according to request priority, thereby preventing starvation.
6. (Original) The method as recited in claim 4 wherein the round robin scheme considers multiple requests before allocating resources according to request priority.
7. (Cancelled)

8. (Original) The method as recited in claim 1 wherein priority is assigned to at least each requested resource according to resource priority for each arbitration cycle.

9. (Previously presented) The method as recited in claim 1 wherein assigning priorities further comprises:
combining resource priority and a requester priority to generate an assigned priority for each combined requester and resource priority.

10. (Original) The method as recited in claim 1 wherein the requesters are input ports of a network switch and the resources are output ports of the network switch, multiple ones of the output ports being accessible to more than one of the input ports.

11. (Original) The method as recited in claim 1 wherein the requesters are processors of a multi-processor system and the resources are memories coupled to the processors, each of the memories being accessible to more than one of the processors.

12. (Original) The method as recited in claim 1 further comprising recalculating priorities after each time a resource is allocated.

13. (Currently amended) A method for allocating multiple resources to multiple requesters, comprising:
receiving requests for the multiple resources from the multiple requesters; and
allocating respective resources to respective requesters according to respective priorities inversely related to determined by at least a number of requests directed to each respective ones of the resources.

14. (Original) The method as recited in claim 13 further comprising allocating the respective resources to the respective requesters according to a starvation avoidance mechanism.

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15. (Currently amended) An arbitration apparatus for arbitrating requests from a plurality of requesters for a plurality of resources, comprising:

means for receiving requests for resources from the requesters;

means for allocating requests according to at least resource priority; and

means for determining resource priority according to a number of requests made for

[[the]] respective ones of the resources, [[the]] respective resource priorities being

inversely related to the number of requests made for the respective ones of the

resources resourcee.

16. (Previously presented) The arbitration apparatus as recited in claim 15 further comprising:

means for allocating requests according to requester priority; and

means for determining requester priority for each respective requester according to a

number of requests made by the respective requesters, the requester priority being

inversely related to the number of requests.

17. (Cancelled)

18. (Original) The arbitration apparatus as recited in claim 15 further comprising means for preventing starvation for requests.

19. (Previously presented) An apparatus comprising:

a transport mechanism attached to a plurality of resources and a plurality of requesters;

an arbiter coupled to receive a plurality of requests from the requesters, each of the

requests requesting at least one of the resources, the arbiter allocating resources to

requesters according to at least a resource priority, the resource priority being

inversely related to a number of requests directed to respective resources.

20. (Original) The apparatus as recited in claim 19 wherein the arbiter further includes a round robin mechanism to allocate resources to requesters.

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21. (Original) The apparatus as recited in claim 19 wherein the requesters are processors, the resources are memories, each of the memories being coupled to multiple ones of the processors and the transport mechanism is a plurality of buses coupling the processors to the memories.

22. (Original) The apparatus as recited in claim 19 wherein the requesters are input and output nodes of a network and the transport mechanism is a switch.

23. (Currently amended) A method of sharing multiple resources among multiple requesters using an arbiter, comprising:
receiving requests for the multiple resources from the multiple requesters; and
allocating resources among the requesters as a function of a number of requests made,
wherein the function of the number of requests utilizes, at least in part, how many requests are made for each resource, and wherein resource allocation is inversely related to how many requests are made for each resource.

24. (Cancelled)

25. (Cancelled)

26. (Original) The method as recited in claim 23 wherein the function of the number of requests utilizes a combination of how many requests made for each resource and how many requests are made by each requester.

27. (Currently amended) A computer program product encoded in at least one computer readable medium to implement an arbitration mechanism to allocate multiple resources among multiple requesters, the computer program product comprising:
code executable to receive requests for the multiple resources from the multiple requesters; and

code executable to allocate respective resources to respective requesters according to
respective priorities determined by at least inversely related to a number of
requests directed to each respective ones of the resources.

28. (Original) The computer program product as recited in claim 27 wherein the
computer program product further includes code to implement a starvation avoidance
mechanism.

29. (Original) The computer program product as recited in claim 27,
wherein the at least one computer readable medium is selected from the set of a disk, tape
or other magnetic, optical, or electronic storage medium and a network, wireline,
wireless or other communications medium.

30. (Previously presented) The method as recited in claim 13, wherein the respective
resource priorities are inversely related to the number of requests made for the respective
resource.